LW600-LX900-LX1000 RS232 Codes-Basic Technical Reference Information

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1 Overview

This specification defines projector control commands for the 103-019101-01(LW600).

The projector control commands are designed to remote-control a projector through RS-232C from a computer.

See 8. Commands with Address Specification when using commands with address.

2 Serial Interface Specification

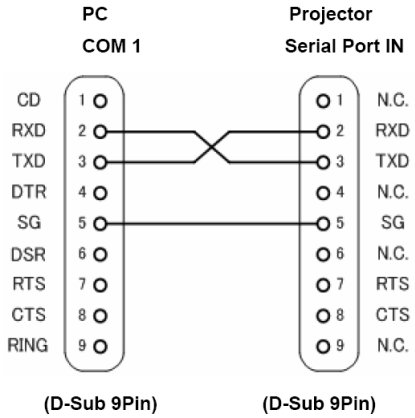
2.1 Transfer Specification

Items	Specification
Synchronous system	Asynchronous
Transmission Speed	9600/19200 bps
Data Length	8 bits
Parity	None
Stop Bit	1
Flow Control	None

1) Transmission speed: initial setting value is 19200 bps.
2) Transmission speed can be changed in Service Mode.

2.2 Connection

Dedicated serial cables that come with a projector must be used for the connection to a computer and the projector.



Connect COM port of the computer to SERIAL PORT IN of the projector.

COM Port (COM1 or COM2) of a computer is specified by control software of the computer.

3 Notes for Communication

The projector command is defined one command per line that starts “C” and ends carriage return (0x0D).

When the projector receives the carriage return, it starts decoding.

There are two types of commands:

- Functional Execution Commands

  Example: “C05” [CR]

- Status Read Commands.

  Example: “CR0” [CR]

The buffer clears the information it stores in the following cases.

- When the projector receives LF (0x0A) or EOF (0x1A9).
- When it takes more than one second to receive a single command.

  (Until receiving the carriage return after the reception of the first data.)

When pipelining control commands, allow interval time as below after the reception of response,

1) [ZOOM UP/DOWN] [FOCUS UP/DOWN] [LENS SHIF UP/DOWN/LEFT/ RIGHT] commands…100ms 2)
2) Other commands…500ms

When pipelining Status Read command, allow at least 500ms of interval time after the response.

Do not issue any command before receiving the response except the case that there is no response for 5 seconds.

It takes about 7 seconds for internal initialization after plugging in AC. During this time, it cannot process command. Do not issue any commands.

For 7 seconds after starting POWER ON in the status of STANDBY, the projector returns “Acceptable” response, but it does not carry out the command. Status Read commands are carried out in 500 ms after the “Acceptable” response is returned.

During Count Down and Cooling Down operation; in the period of the Count Down operation after Power ON or Cooling Down after Power OFF, “Acceptable” response is returned, but the command is not carried out except for Status Read command.

During switching inputs; it takes 5 seconds to switch inputs after receiving the command. During this period, even if another command is received, it is not carried out although returning “Acceptable” response. However, Status Read commands are carried out in 500 ms after the “Acceptable” response is returned.

The length of the returned value for Status Read command in successful operation depends on the command.

The characters for commands must be in uppercase (A - Z). Lowercase can not be used.

4 Functional Execution Commands Table

Command	Item
C00	POWER ON
C01	POWER OFF (Immediate POWER OFF)
C05	INPUT 1
C06	INPUT 2
C07	INPUT 3
C08	INPUT 4
C0D	VIDEO MUTE ON
C0E	VIDEO MUTE OFF
C0F	SCREEN NORMAL SIZE
C10	SCREEN FULL SIZE
C1C	MENU ON
C1D	MENU OFF
C1E	DISPLAY CLEAR
C27	IMAGE
C30	D.ZOOM +
C31	D.ZOOM -
C3A	POINTER RIGHT
C3B	POINTER LEFT
C3C	POINITER UP
C3D	POINITER DOWN
C3F	ENTER

Command	Item
C43	FREEZE ON
C44	FREEZE OFF
C46	ZOOM -
C47	ZOOM +
C4A	FOUCS -
C4B	FOUCS +
C5D	LENS SHIFT UP
C5E	LENS SHIFT DOWN
C5F	LENS SHIFT LEFT
C60	LENS SHIFT RIGHT
C89	AUTO PC ADJ.
C8A	PRESENTATION TIMER
C8E	KEYSTONE ↑
C8F	KEYSTONE ↓
C90	KEYSTONE →
C91	KEYSTONE ←

5 Status Read Commands Table

Command	Item
CR0	Status Read
CR1	Input Mode Read
CR3	Lamp Time Read
CR4	Setting Read
CR6	Temp. Read
CR7	Lamp Mode Read
CR9	PC Type Read
CRA	Status 2 Read

6 Functional Execution Commands

6.1 Format

The PC issues a command in the format below:

“C” Command [CR]

The command: has two characters

See Functional Execution Commands Table.

A projector decodes the received data and returns the result after getting ready to receive another command.

[ACK] [CR]: (0x06, 0x0D) when the projector has received Functional Execution Commands.

“?” [CR]: When the resceived data cannot be decoded

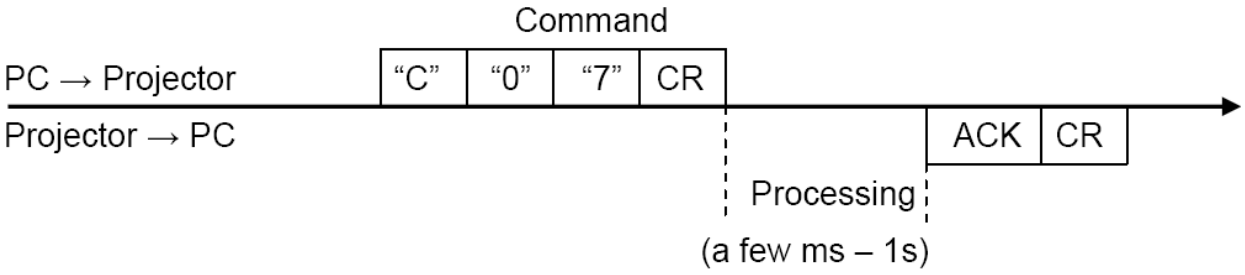
6.2 Command Pipelining

Functions which need command pipelining follow the rule below.

- Sender system issues any command every 100ms.
- When receiving the applicable command, the function is executed for 120ms from the moment.
- When receiving the same command in succession within 120ms, the function is executed for another 120ms from the moment.
- When there is no incoming command after 120ms, the execution of pipelining is stopped.
- When the projector receives incoming other command within 120ms, the execution of pipelining is stopped.

6.3 Transfer Example

Changing input to INPUT3 with Basic Command.



6.4 Operation Requirements

When the projector is in the status below, Functional Execution Commands are limited. (Status Read Commands are available in following status)

Projector Status	Available Functional Execution Commands
In Standby mode	C00: POWER ON
Count Down in process	C00: POWER ON (Countdown is terminated)
Cooling Down in process	NONE (No Execution)
Cooling Down in process due to abnormal temperature	NONE (No Execution)
In Abnormal Temperature	NONE (No Execution)
In Abnormal Power Status	NONE (No Execution)
On switching modes	NONE (No Execution)
Power Saving Cooling Down in process	NONE (No Execution)
In Power Saving status	C00: POWER ON C01: POWER OFF

Note) In the above status, it returns [ACK] [CR] even if the projector receives other commands,

6.5 POWER ON Command

COMMAND	“C00” [CR]	
Detail	Power ON When Power is already ON, no operation starts. When sending this command during Count Down in process, Count Down process is terminated.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.6 POWER OFF Command (Immediate POWER OFF)

COMMAND	“C01” [CR]	
Detail	Power OFF (Standby) When Power is turned OFF with ON/STAND-BY button of the projector and remote control, “Power OFF” is displayed. In contrast, this command executes immediately Power OFF.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.7 INPUT 1 Command

COMMAND	“C05” [CR]	
Detail	Select Input 1 Note) When there is no board inserted to Input 1, it is not executed.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.8 INPUT2 Command

COMMAND	“C06” [CR]	
Detail	Select Input 2 Note) When there is no board inserted to Input 2, it is not executed.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.9 INPUT 3 Command

COMMAND	“C07” [CR]	
Detail	Select Input 3 Note) When there is no board inserted to Input 3, it is not executed.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.10 INPUT 4 Command

COMMAND	“C08” [CR]	
Detail	Select Input 4 Note) When there is no board inserted to Input 4, it is not executed.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.11 VIDEO MUTE ON Command

COMMAND	“C0D” [CR]	
Detail	Video Mute ON This command works the same way as “SHUTTER” button of the remote control, but it works only for Shutter Open, not for Shutter Close.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.12 VIDEO MUTE OFF Command

COMMAND	“C0E” [CR]	
Detail	Video Mute OFF This command works the same way as “SHUTTER” button of remote control, but it works only for Shutter Close, not for Shutter Open.	
Response	**Acceptable**	**[ACK] [CR]**
	Unacceptable	**“?” [CR]**

6.13 SCREEN NORMAL SIZE Command

COMMAND	“C0F” [CR]	
Detail	Set screen mode to Normal	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.14 SCREEN FULL SIZE Command

COMMAND	“C10” [CR]	
Detail	Set screen mode to Full	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.15 MENU ON Command

COMMAND	“C1C” [CR]	
Detail	Display Menu of On Screen Display	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.16 MENU OFF Command

COMMAND	“C1D” [CR]	
Detail	Clear Menu of On Screen Display	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.17 DISPLAY CLEAR Command

COMMAND	“C1E” [CR]	
Detail	Clear On Screen Display Clear On Screen Display unconditionally.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.18 IMAGE Command

COMMAND	“C27” [CR]	
Detail	Switch Image setting. In the case of the projector and remote control possessing an “IMAGE” button, this command work as an “IMAGE” function.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.19 D.ZOOM + Command

COMMAND	“C30” [CR]	
Detail	Enter Digital Zoom mode and expand image size. This command works the same way as “D.zoom▲” button of remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.20 D.ZOOM – Command

COMMAND	“C31” [CR]	
Detail	Enter Digital Zoom mode and compress image size. This command works the same way as “D.zoom▼” button of remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.21 POINTER RIGHT Command

COMMAND	“C3A” [CR]	
Detail	Move Pointer of On Screen Display Menu to the right This command works the same way as “►” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.22 POINTER LEFT Command

COMMAND	“C3B” [CR]	
Detail	Move Pointer of On Screen Display Menu to the left This command works the same way as “◄” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.23 POINTER UP Command

COMMAND	“C3C” [CR]	
Detail	Move Pointer of On Screen Display Menu upward. This command works the same way as “▲” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.24 POINTER DOWN Command

COMMAND	“C3D” [CR]	
Detail	Move Pointer of On Screen Display Menu downward. This command works the same way as “▼” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.25 ENTER Command

COMMAND	“C3F” [CR]	
Detail	This command works the same way as “SELECT” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.26 FREEZE ON Command

COMMAND	“C43” [CR]	
Detail	Freeze on-screen picture This command works the same way as “FREEZE” button of the remote control, but it works only for turning on, not for turning off Freeze.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.27 FREEZE OFF Command

COMMAND	“C44” [CR]	
Detail	Cancel Freeze function This command works the same way as “FREEZE” button of the remote control, but it works only for turning off, not for turning on Freeze.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.28 ZOOM + Command

COMMAND	“C47” [CR]	
Detail	Make screen image larger This command works the same way as “ZOOM▲” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.29 ZOOM – COMMAND

COMMAND	“C46” [CR]	
Detail	Make screen image smaller This command works the same as “ZOOM ▼” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.30 FOCUS + Command

COMMAND	“C4B” [CR]	
Detail	Adjust focus of screen image (sharp and clear) with a long-focal-length (∽) (The lens direction is backward) This command works the same way as “FOCUS ▲” button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.31 FOCUS – Command

COMMAND	"C4A" [CR]	
Detail	Adjust focus of screen image (sharp and clear) with a short-focal-length (The lens direction is forward) This command works the same way as "FOCUS ▼" button of the projector and remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	"?" [CR]

6.32 LENS SHIFT UP Command

COMMAND	"C5D" [CR]	
Detail	Move screen image upward	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	"?" [CR]

6.33 LENS SHIFT DOWN Command

COMMAND	"C5E" [CR]	
Detail	Move screen image downward	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	"?" [CR]

6.34 LENS SHIFT LEFT Command

COMMAND	"C5F" [CR]	
Detail	Move screen image to the left.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	"?" [CR]

6.35 LENS SHIFT RIGHT Command

COMMAND	"C60" [CR]	
Detail	Move screen image to the right.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	"?" [CR]

6.36 AUTO PC ADJ. Command

COMMAND	“C89” [CR]	
Detail	Execute Auto PC Adj. function This command works the same way as “AUTO” button of the projector and remote control. When this command is received during Auto PC Adj. operation, the operation is stopped.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.37 PRESENTATION TIMER Command

COMMAND	“C8A” [CR]	
Detail	Start timer to count time for presentation This command works the same way as “P-TIMER” button of the remote control.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.38 KEYSTONE ↑ Command

COMMAND	“C8E” [CR]	
Detail	Correct keystone distortion by reducing upper part of image.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.39 KEYSTONE ↓ Command

COMMAND	“C8F” [CR]	
Detail	Correct keystone distortion by reducing lower part of image.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.40 KEYSTONE → Command

COMMAND	“C90” [CR]	
Detail	Correct keystone distortion by reducing right part of image.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

6.41 KEYSTONE ← Command

COMMAND	“C91” [CR]	
Detail	Correct keystone distortion by reducing left part of image.	
Response	**Acceptable**	[ACK] [CR]
	Unacceptable	“?” [CR]

7 Status Read Commands

7.1 Format

PC issues a command in the format below:

"CR" Command [CR]

Command: Single character

See Status Read Commands Table.

When a projector receives the appropriate command, it returns the required information as a data string.

Required Data [CR]

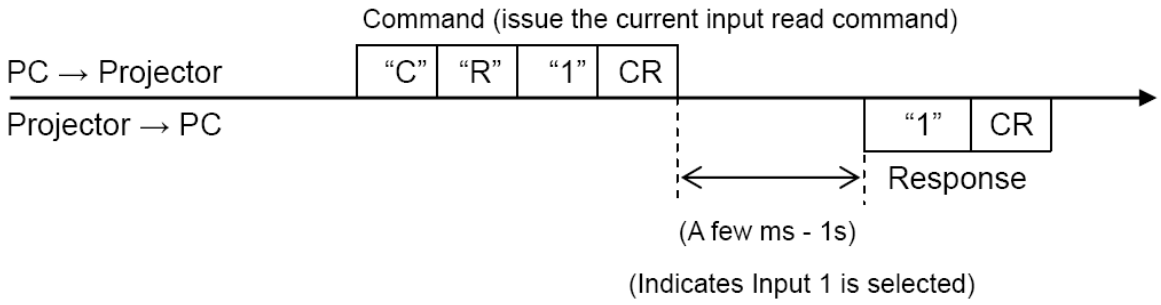
Required Data: String

See Status Read Commands Table.

When the received data cannot be decoded, the projector returns "?" [CR].

7.2 Transfer Example

Get the selected input for the projector by Basic Commands. Command (issue the current input read command)

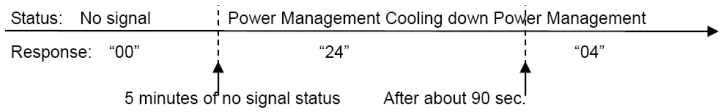


7.3 Status Read Command

COMMAND	"CR0" [CR]	
Detail	Get the projector status	
Response	**Acceptable**	"%1" [CR]
	%1	"00" = Power ON "80" = Standby "40" = Countdown in process "20" = Cooling Down in process "10" = Power Failure "28" = Cooling Down due to Abnormal Temperature in process "02" = Cannot accept RS-232C Command "24" = Power Management Cooling Down in process "04" = Power Management status "21" = Cooling Down in process after Off due to lamp failure "81" = Standby after Cooling Down due to lamp failure "88" = Standby after Cooling Down due to Abnormal Temperature "2C" = Cooling Down in process after Power Off due to Shutter management "8C" = Standby after Cooling Down due to Shutter management
	Unacceptable	"?" [CR]

Response Detail

Response	Status	Description
"00" [CR]	Power ON	Normal image is on screen.
"80" [CR]	Standby	When the status is Standby, Status Read Commands are always accepted, but Functional Execution Commands are not accepted except POWER ON Command.
"40" [CR]	Countdown in process	When "Display" in Setting menu is set to ON, execution of Power ON operation brings into Countdown status. When "Display" in Setting menu is set to OFF, the status jumps to Power ON without Countdown operation.
"20" [CR]	Cooling down in process	Execution of POWER OFF Command ("C01" [CR]) in power on status brings into Cooling Down status. This status automatically moves to Standby when the lamp is turned off and the fan spin finishes after about 90 seconds (the time of spinning fan depends on models). During this time, Functional Execution Commands are not accepted.

Response	Status	Description
“10” [CR]	Power Failure	When the power supply voltage inside the projector reaches abnormal level, the status automatically moves to Power OFF. ※ Abnormal power supply voltage includes; • -Filter abnormal status • -Shutter abnormal status The projector returns “10” [CR], which indicates the status moves to Power OFF due to power failure. Fan also stops.
“28” [CR]	Cooling down due to abnormal temperature in process	When the internal temperature rises abnormally, it automatically starts Cooling Down process. Response value for this status is “28” [CR]. Even if the temperature comes down during this process, the given Cooling Down process is executed and it moves to Standby mode.
“02” [CR]	RS-232C commands cannot be accepted	When receiving this response, resend Status Read Command.
“24” [CR]	Power management cooling down in process	When Power Management function in setting menu is set to ON, continuous 5 minutes of no signal status leads to turning off lamps and starting Cooling Down operation (Green LED on the projector body is turned off). During this period, any Functional Execution Command cannot be accepted. The Power Management Cooling Down operation continues about 90 seconds, then the status moves to Power Management. 
“04” [CR]	Power management	This indicates it has moved to Power Management status according to the setting of Power Management function in Setting menu.
“21” [CR]	Cooling down in process after turned off due to lamp failure	When a projector is turned off because of lamp failure, it automatically starts Cooling Down operation, in which the projector returns “21” [CR].
“81” [CR]	Standby after cooling down due to lamp failure	This value is returned when Cooling Down operation due to lamp failure has been completed and the status has been moved to Standby. The status is kept until the next operation starts.
“88” [CR]	Standby after cooling down due to abnormal temperature	This value is returned when Cooling Down operation due to Abnormal Temperature has been completed and the status has been moved to Standby. The status is kept until the next operation starts.
“2C” [CR]	Cooling down in process due to shutter management function	This indicates it has moved to Cooling down status according to the setting of Shutter Management function in setting menu. During this time, Functional Execution Commands are not accepted.
“88” [CR]	Standby after Cooling Down due to Shutter management function	This value is returned when Cooling Down operation due to Shutter management has been completed and the status has been moved to Standby. The status is kept until the next operation starts. When projector is turned on again, it cancels the last status and starts normal operation.

7.4 Input Mode Read Command

COMMAND	"CR1" [CR]	
Detail	Get currently selected SLOT	
Response	**Acceptable**	"%1" [CR]
	%1	"1" = Input 1 is selected "2" = Input 2 is selected "3" = Input 3 is selected "4" = Input 4 is selected (In the case SLOT method, SLOT 1~4 is selected.)
	Unacceptable	"?" [CR]

7.5 Lamp Time Read Command

COMMAND	"CR3" [CR]	
Detail	Get total lamp running hours	
Response	**Acceptable**	"%1_%2" [CR]
	%1, %2	Each lamp data follows in sequence with one space between each of them. %1 = lamp No.1 %2 = lamp No.2 Example: "0410_0410_0410_0410" [CR] ▪▪▪▪ → Lamp No.1 = 410 Hours Lamp No.2 = 410 Hours *Note: Each piece of data has 4 digits."9999" is returned for 10,000 hours or more.*
	Unacceptable	"?" [CR]

7.6 Setting Read Command

COMMAND	"CR4" [CR]	
Detail	Get screen setting status of Ceiling/Rear.	
Response	**Acceptable**	"%1" [CR]
	%1	"11" [CR] = Normal Screen Setting "10" [CR] = Picture is top/bottom reversed (Status: Rear & Ceiling ON) "01" [CR] = Picture is left/right reversed (Status: Rear ON) "00" [CR] = Picture is top/bottom and left/right reversed (Status: Ceiling ON)
	Unacceptable	"?" [CR]

7.7 Temp Read Command

COMMAND	“CR6” [CR]	
Detail	Get the temperature information inside projector With more than one temperature sensors installed in the projector, it is possible to get all temperatures at once.	
Response	**Acceptable**	“%1__%2__%3” [CR]
	%1, %2	%1 = temperature at Sensor 1 %2 = temperature at Sensor 2 %3 = temperature at Sensor 3 Temperature data is expressed as “00.0”. When the temperature goes under 0, the first character is “-” like “-05.5” [CR]. When no temperature data returns due to hardware problems, the first character is “E” like” E00.0” [CR]. With more than one temperature sensors installed, the projector returns the values in series. Example: “_31.5_ _35.2_ _33.4” [CR] Each sensor data follows in sequence with one space between each of them.
	Unacceptable	“?” [CR]

7.8 Lamp Mode Read Command

COMMAND	“CR7” [CR]	
Detail	Get current Lamp Mode in the multiple-lamp projector. When there is any fail lamp, also can get the information about.	
Response	**Acceptable**	“%1” [CR]
	%1	Example: “0F”[CR] The first digit indicates the lamp mode. 0 = 2-lamp mode 1 = 1-lamp mode (Lamp No.1 used) 2 = 1-lamp mode (Lamp No.2 used) The second digit indicates if the lamp is ON or OFF. Data is shown as “0-9” and “A-F”, which is described in 4-bit data. Assign each bit for each lamp data. Examples: 0 = ALL are OFF 1 = No.1 is ON, the other is OFF 2 = No.2 is ON, the other is OFF 3 = ALL are ON
	Unacceptable	“?” [CR]

7.9 PC Type Read Command

COMMAND	“CR9” [CR]	
Detail	Get the currently displayed PC Type	
Response	**Acceptable**	“%1” [CR]
	%1	“Stand_by” - Standby “AV_Mode” - AV Mode Current Table such as “UXGA1” - PC Mode “Go_PC_adj.” - Auto “No_signal” - No signal
	Unacceptable	“?” [CR]

7.10 Status 2 Read Command

COMMAND	“CRA” [CR]	
Detail	Get the operating status of Video mute.	
Response	**Acceptable**	“%1” [CR]
	%1	Return a hex digit of 1 byte as two columns of character string. Define each bit as eight bits by a hex digit as follows. * * * * * * * * | | | | | | | └ bit0:Shutter Close = 1 / Open = 0 | | | | | | └── bit1:Spare | | | | | └──── bit2:Spare | | | | └────── bit3:Spare | | | └──────── bit4:Spare | | └────────── bit5:Spare | └──────────── bit6:Spare └──────────────bit7:No signal=1, signal=0 Example: Normal Operation: “00” Shutter Close: “01” No signal: “80” When in Standby mode or Cooling Down process, it returns “FF” even if the status is above.
	Unacceptable	“?” [CR]

8 Commands with Address Specification

8.1 Overview

Commands with an address are used to control more than one projector remotely through RS-232C by a single computer.

The command with address is defined as a single command per line that starts with an ”A” and ends with carriage return (0x0D).

When a projector receives carriage return (0x0D), it starts decoding.

The address such as “A001” is prefixed to the Basic Serial Command or Expand Serial Command already mentioned:

e.g.) Functional Execution Command: “A001C05” [CR]

e.g.) Status Read Command: “A001CR0” [CR]

The projector has the function to set up its own address in Service mode.

Initial setting is “No. 001.”

The available range of values is “001” to “999”

The projector clears the data in the receive buffer under following conditions.

- When receiving LF (0x0A) or EOF (0x1A).
- When it takes more than one second to receive a single command. (until receiving a carriage return after the reception of the first data.)

It returns the response within 60ms.

8.2 Functional Execution Command with address

8.2.1 Format

The PC issues a command in the format below:

“A” Address “C” Command [CR]

or

“C” Address “CF□” Command “□” Parameter [CR]

Address: 3-digit number (”001”-”999”)

Commands with “FFF” as the address are valid to all projectors.

Command: String (Refer to Basic and Expand Serial Commands)

The only projector that have the address number matching with the one included in the received data decodes the command, and when it gets ready to receive another command, it returns one of these two responses:

- [ACK] [CR]: When receiving Functional Execution Command (0x06, 0x0D)
- "?" [CR]: When the received data cannot be decoded

However, when the address is "FFF", the projector executes the function but does not return any response.

8.2.2 When the command pipelining is needed

Functions that need command pipelining follow the rules below.

- Sending-side system issues commands every 100 ms
- When receiving an applicable command, the function is executed repeatedly for 120 ms.
- When receiving the same command in a row within 120 ms, the function is repeatedly executed for another 120 ms from the moment.
- When there is no incoming command after 120 ms, the execution of pipelining is stopped.
- When the projector receives other command within 120 ms, the execution of pipelining is stopped.

8.3 Status Read Command with Address

8.3.1 Format

The PC issues a command in the format below:

"A" Address "CR" Command [CR]

or

"A" Address "CR□" Command [CR]

Address: 3-digit number ("001"-"999")

Command: String (Refer to Basic and Expand Serial Commands)

The only projectors that have the address matching with the one in the received data decode the command, and it returns required data.

Required Data [CR]

Required Data: String

See Status Read Commands Table.

*When the received data cannot to be decoded, the projector returns **"?" [CR]**.